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Making use of chalk, instead of hard limestone, this cost would be greatly reduced.

A large number of manufacturing experiments, which I have conducted upon a small scale in the laboratory, have proved by practical demonstration that there can be made from materials at hand in this State, a Portland cement quite as good in quality as the imported article; and that this can be done in Kansas at an expense much less than in any other State in the Union, is equally well established.

ANALYSIS OF KANSAS SOILS.

By G. E. Patrick, Professor of Chemistry and Physics, in University of Kansas.

I have recently submitted to analysis samples of two soils from Wallace county, Kansas. As the results show them to be quite rich in certain elements of plant-food, and as no soils from that part of the state have heretofore been analyzed, it may not be out of place to submit a report of my analyses to the Academy.

Both samples were collected in September, 1875, by Mr. S. W. Williston, member of Professor Mudge's geological party. Neither of the plats from which they were taken has ever been cultivated.

Both samples were thoroughly air-dried, at ordinary temperature of the laboratory, before analysis.

SAMPLE NO. 1.

This was an upland soil, taken from the high prairie of Smoky Hill Valley, near Monument Rocks, Wallace county.

It yielded upon analysis:

Water		3.449	
Organic matter		5.224	
Soluble in cold hydrochloric acid..	{	Oxide of Iron	1.778
		Alumina .....	.721
		Lime	1.618
		Magnesia	2.084
		Potassa .....	.202
		Soda .....	.002
		Silicic acid.....	.023
		Sulphuric acid.....	.078
		Carbonic acid.....	2.567
Insoluble in cold hydrochloric acid.....	{	Phosphoric acid.....	.118
		Sodium chloride.....	.009
		82.127	
		<hr/>	
		100.000	

SAMPLE NO. 2.

This sample was taken from the upper loam of the Smoky Hill Valley bottom lands, thirty miles east of Fort Wallace, Wallace county.

It yielded upon analysis:	
Water	1.895
Organic matter	3.039
Soluble in cold hydrochloric acid....	{ Oxide of Iron..... 1.503
	{ Alumina ..... .557
	{ Lime 4.268
	{ Magnesia ..... .422
	{ Potassa ..... .214
	{ Soda ..... .038
	{ Silicic acid..... .050
	{ Sulphuric acid..... .041
	{ Carbonic acid..... 3.510
Insoluble in cold hydrochloric acid.....	{ Phosphoric acid..... .173
	{ Sodium chloride..... .003
84.287	
100.000	

One fact indicated by the above figures deserves special notice, namely, that of the alkaline bases present in the soluble portion of both these soils, potassa constitutes nearly the entire amount, while soda is found in but small quantity, especially in No. 1, where it is well nigh absent.

Considering that these soils have never been treated with fertilizers, the amount of phosphoric acid is almost exceptionally large.

The better to illustrate these points, and to facilitate general comparison, I have arranged these analyses, together with those of four other soils, in the following table. Nos. 1 and 2 are the Wallace county soils; No. 3 is from a plat in Wyandotte county, Kansas, that had been for eighteen years in blue-grass; No. 4 is an English clover soil, considered good; Nos. 5 and 6 are from Belmont county, Ohio, both upland; No. 5 a surface soil; No. 6 a subsoil.*

	Wallace county upland,	Wallace county bottom.	Wyandotte Co.	England	Belmont Co. Ohio, upland surface soil.	Belmont Co., Ohio, upland subsoil.
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Water.....	3.449	1.895	3.800	.....	2.260	2.220
Organic Matter.....	5.224	3.039	5.440	5.340	7.740	4.400
Soluble in hydrochlo- ric acid {	1.778	1.503	2.575	6.070	8.327	6.810
	.721	.557	4.325	4.510	1.550	2.830
	1.618	4.268	.675	4.205	2.333	3.343
	2.084	.422	.063	1.270	.920	.027
	.202	.214	.048	.520	.....	.....
	.002	.038	.125	.160	.....	.....
	.023	.050	.....	.....	.....	.....
	.078	.041	.386	.196	2.340	2.820
	2.567	3.510	.....	3.305	.....	.....
	.118	.173	.080	.150	.032	.087
	.009	.003	.045	.080	.....	.....
Insoluble in hydrochloric acid	82.127	84.287	82.157	73.840	74.498	77.463
100.000		100.000	99.719	99.590	100.000	106.000

* Nos. 3 and 4 are taken from the Report for 1874, of the Kansas State Board of Agriculture. Nos. 5 and 6 are from the Report of the U. S. Commissioner of Agriculture, for 1869.